IN THE CLAIMS:

1-21 (cancelled)

22. (currently amended) A method of detecting activity of a G protein-coupled receptor (GPCR) in response to ligand binding, comprising:

(a) expressing the GPCR in a cell from an exogenous nucleic acid molecule;

(b) expressing in the cell a mutant cyclic nucleotide-gated CNG channel comprising at least one mutation that makes the channel more sensitive to cAMP than a channel that does not comprise the mutation;

(c) exposing the cell to at least one membrane potential dye that produces a fluorescent signal in response to cell depolarization; ~~and~~

(d) exposing the cell to said ligand; and

(e) measuring detectable fluorescence signals from the dye in the cell indicative of activity of the channel, wherein activity of the channel indicates activity of the GPCR in response to said ligand.

23. (original) A method according to claim 22, wherein the CNG channel is expressed from an exogenous nucleic acid.

24. (original) A method according to claim 22, wherein the CNG channel is expressed from the genome of the cell.

25. (cancelled)

26. (previously presented) A method according to claim 22, wherein the dye can be detected by UV-based imaging systems.

27. (cancelled)

28. (previously presented) A method according to 22, wherein the dye is a voltage sensitive dye.

29. (original) A method according to claim 22, wherein measuring comprises determination of CNG channel activity in a single cell.

30. (original) A method according to claim 29, wherein activation is determined by UV-based fluorescence using a microscope.

31. (original) A method according to claim 30, wherein the microscope is coupled to a computer system.

32. (original) A method according to claim 31, wherein the computer system tracks individual cells and performs statistical analysis.

33. (original) A method according to claim 22, wherein measuring is performed with a multiwell microplate reader.

34. (original) A method according to claim 33, wherein the reader is a fluorometric-based reader with a CCD camera.

35. (original) A method according to claim 33, wherein the reader is a fluorometric-based scanning microplate reader.

36. (previously presented) A method according to claim 22, comprising attaching the cell to a solid surface.

37. (original) A method according to claim 36, wherein the solid surface is selected from the group consisting of slides and multiwell plates.

38. (original) A method according to claim 22, wherein the cell is pretreated with a cAMP analogue before measuring.

39. (original) A method according to claim 22, wherein the cell further expresses a promiscuous G protein.

40. (previously presented) A method according to claim 22, comprising determining ion flux.

41. (currently amended) A method according to claim 40, wherein ion flux is determined by a change in spectral characteristic of ~~a~~ the dye.

42. (cancelled)

43. (currently amended) A method of identifying a putative ligand for a G protein coupled receptor, comprising:

(a) contacting a cell with a compound wherein the cell expresses the receptor and at least one cyclic nucleotide-gated (CNG) channel, wherein the receptor is not endogenous to the cell and the CNG channel is a mutant CNG channel that has been engineered to increase the channel sensitivity to cAMP;

(b) exposing the cell to at least one membrane potential dye that produces a fluorescent signal in response to cell depolarization; and

(c) measuring detectable fluorescence signals from the dye in the cell indicative of activity of the CNG channel, wherein activation of the CNG channel indicates that the compound is a putative ligand for the receptor.

44. (original) A method according to claim 43, wherein the CNG channel is expressed from an exogenous nucleic acid.

45. (original) A method according to claim 43, wherein the CNG channel is expressed from the genome of the cell.

46. (cancelled)

47. (previously presented) A method according to claim 43, wherein the dye can be detected by UV-based imaging systems.

48. (cancelled)

49. (previously presented) A method according to 43, wherein the dye is a voltage potential sensitive dye.

50. (previously presented) A method according to claim 43, wherein measuring comprises determination of CNG channel activity in a single cell.

51. (original) A method according to claim 50, wherein activation is determined by UV-based fluorescence using a microscope.

52. (original) A method according to claim 51, wherein the microscope is coupled to a computer system.

53. (original) A method according to claim 51, wherein the computer system tracks individual cells and performs statistical analysis.

54. (original) A method according to claim 43, wherein measuring is performed with a multiwell microplate reader.

55. (original) A method according to claim 54, wherein the reader is a fluorometric-based reader with a CCD camera.

56. (original) A method according to claim 55, wherein the reader is a fluorometric-based scanning microplate reader.

57. (previously presented) A method according to claim 43, comprising attaching the cell to a solid surface.

58. (original) A method according to claim 57, wherein the solid surface is selected from the group consisting of slides and multiwell plates.

59. (original) A method according to claim 43, wherein the cell is pretreated with a cAMP analogue before being contacted with the ligand.

60. (original) A method according to claim 43, wherein the cell further expresses a promiscuous G protein.

61. (previously presented) A method according to claim 43, comprising determining ion flux.

62. (currently amended) A method according to claim 61, wherein ion flux is determined by a change in spectral characteristic of ~~a~~ the dye.

63. (cancelled)

64. (currently amended) A method of identifying ~~an~~ a putative agent that modulates an activity mediated by a GPCR comprising:

(a) contacting a cell with the agent and a ligand for the GPCR wherein the cell expresses the GPCR and at least one cyclic nucleotide-gated (CNG) channel and, wherein the CNG channel is a mutant CNG channel that has been engineered to increase the channel sensitivity to cAMP;

(b) exposing the cell to at least one membrane potential dye that produces a fluorescent signal in response to cell depolarization; and

(c) measuring detectable fluorescence signals from the dye in the cell indicative of activity of the CNG channel, wherein a putative agent is identified when the activity in the presence of the agent is greater or lesser than the activity in the absence of the agent.

65. (previously presented) A method according to claim 64, further comprising:

(c) comparing the activity of the CNG channel to the activity of the channel in the absence of the agent, wherein a difference in the activity of the CNG channel indicates the agent modulates the activity.

66. (original) A method according to claim 64, wherein the CNG channel is expressed from an exogenous nucleic acid.

67. (original) A method according to claim 64, wherein the CNG channel is expressed from the genome of the cell.

68. (cancelled)

69. (previously presented) A method according to claim 64, wherein the dye can be detected by UV-based imaging systems.

70. (cancelled)

71. (previously presented) A method according to 69, wherein the dye is a voltage sensitive dye.

72. (cancelled)

73. (previously presented) A method according to claim 64, wherein channel activity is determined by UV-based fluorescence using a microscope.

74. (original) A method according to claim 73, wherein the microscope is coupled to a computer system.

75. (original) A method according to claim 74, wherein the computer system tracks individual cells and performs statistical analysis.

76. (original) A method according to claim 64, wherein measuring is performed with a multiwell microplate reader.

77. (original) A method according to claim 76, wherein the reader is a fluorometric-based reader with a CCD camera.

78. (original) A method according to claim 76, wherein the reader is a fluorometric-based scanning microplate reader.

79. (previously presented) A method according to claim 64, comprising attaching the cell to a solid surface.

80. (original) A method according to claim 79, wherein the solid surface is selected from the group consisting of slides and multiwell plates.

81. (original) A method according to claim 64, wherein the cell is pretreated with a cAMP analogue before being contacted with the ligand.

82. (original) A method according to claim 64, wherein the cell further expresses a promiscuous G protein.

83-102 (cancelled)

103. (new) The method of claim 22 further comprising comparing the activity of said channel in response to said ligand to activity of said channel in the absence of ligand.

104. (new) The method of claim 43 further comprising comparing the activity of said channel in response to said compound to activity of said channel in the absence of said compound.

105. (new) The method of claim 64 further comprising comparing the activity of said channel in response to said agent to activity of said channel in the absence of said agent.